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SELECTED ARTICLES FROM "LABORATORNOYE DELO"
ON CANCER OF THE UTERINE CERVIX

- USSR -

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SELECTED ARTICLES FROM " LABORATORNOYE DELO"
ON CANCER OF THE UTERINE CERVIX

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[Following are two articles on cancer of the uterine cervix
published in Laboratornoye Delo (Laboratory Work), Vol 7,
No 2, Moscow, February 1961, pages 10-11 and 12 respectively.]

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HISTOCHEMICAL CYTODIAGNOSIS OF CANCER OF THE UTERINE CERVIX

Following is the translation of an article by A. V. Khokhlov and Ye. F. Opaleva in Laboratornoye delo (Laboratory Work), Vol 7, No 2, Moscow, February 1961, pages 10-11.

A most important problem in the diagnosis of malignant neoplasms is the early determination of those peculiarities which distinguish tumor cells from the normal ones from which they are formed. During the last few years, many voices have cautioned against the cytological method of research, which has been widely popular (1). The attempts made by many research workers to find the basic difference between the normal cells' morphology and biochemistry and that of malignant cells in the same tissue have produced negative results. In their search for a characteristic peculiar to tumor cells, many authors have turned to the histochemical method of research.

For the diagnosis of cancer tumors, G. I. Roskin suggested using a modified form of Unna's method, in which the cell elements are subjected to the action of colorless leukobase of methylene blue. With this, nuclei of normal cells are stained an intense blue, while the nuclei of malignant cells remain unstained (2). Many experiments have led G. I. Roskin to the conclusion that this histochemical method can serve as a significant aid in the differential diagnosis of malignant neoplasms.

As far as the mechanism of these reactions goes, many aspects of it remain unclear. G. I. Roskin and M. E. Struve (2) suggest the possibility that the positive staining effect depends on the presence of a fermenting factor in the cells. In some cells, this factor is associated only with the karyoplasm; in others, with the karyoplasm and certain elements of the cytoplasm. They explain the negative reaction by the absence in tumor cells of ferments which are natural to normal cells.

These authors emphasize that a marked difference appears between normal and tumor cells only if the conditions of the reaction are observed meticulously: the determination of the solution's pH, determination of the relation between the amount of hyposulphite and methylene blue, performing the reaction in a well-darkened room, etc.

Various opinions are expressed, both positive and negative, concerning the histochemical method developed by G. I. Roskin and his colleagues. Kaudri (3) mentions Zeelig's unpublished research, which does not agree with G. I. Roskin's conclusions. In connection with this,

we undertook a clinical study of the described method. Our subjects included 62 cases of cancer of the cervix and 64 cases of erosion of the cervix.

Smears or imprints on microscope slides were taken from the tumor or from the eroded part of the cervix and were dried at room temperature. We conducted our observations in a darkened room. We poured a completely colorless leukobase of methylene blue on the slide. Five minutes later we poured the leukobase solution off the slide. After washing the slide with copious amounts of distilled water, we stained the slide with a 0.05% water solution of acid fuchsin. The stain was poured off after one to two minutes, the slide was dried, and then was examined microscopically under oil immersion. The cell nuclei of normal tissues were stained an intense azure blue; the cell nuclei of tumor tissue was red. When this method is used correctly, the difference between normal and malignant cells can easily be seen microscopically. A prepared slide with normal cells is bluish, with malignant cells, red.

Histological observations were made in each case before and after surgery. Smears were examined under a phase-contrasting and under a luminescent microscope.

Out of 64 patients with erosion of the cervix, the reactions were positive in 62 cases. Of 62 cases of cancer of the cervix, a negative reaction was observed in 61. In two cases where morphological symptoms of malignancy were absent, we obtained a negative reaction. G. I. Roskin and M. E. Struve state the possibility that the ability to give a negative reaction precedes the process of malignant growth.

In one case of cancer of the cervix, the histochemical reaction was positive. This confirmed G. I. Roskin's and M. E. Struve's conclusions that a negative reaction with leukobasic methylene blue "is not specific to all malignant cells; the cell nuclei of malignant tumors at various stages of degeneration give a stain of varying intensities ranging from light to dark blue." Our observations confirmed the fact that reaction with leukobasic methylene blue can be a valuable differential diagnostic method of determining pre-cancerous and cancerous conditions.

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- 3) Kaudri, E.; Rakovye Kletki (Cancer cells), Moscow, 1958.

LUMINESCENT MICROSCOPY IN THE CYTODIAGNOSIS OF CANCER OF THE UTERINE CERVIX

[Following is the translation of an article by A. V. Khokhlov and Ye. F. Opaleva in Laboratornoye delo (Laboratory work), Vol 7, No 2, Moscow, February 1961, page 12.]

In an attempt to find new criteria for differential microscopic diagnosis of cancer of the cervix, we decided to study its special qualities with the aid of the luminescent method. We used the ML-1 luminescent microscope, in which an object is examined not by refracted, but by reflected light emitted by the object itself. Visible blue light and overhead lights transmitted through an opaque illuminator were used.

The smears were stained with orange acridine chromofluoride in a 1:4,000 solution. The smears were prepared by getting a sample from the cervix wither with Folman's spoon, or by using an aspirator on a sector of the cervical canal. The smear was transferred to a slide in a drop of chromofluoride. The smear picture is more colorful and more stable in the luminescent microscope than in an ordinary one.

The total examined was 203 women who had sought help at the gynecological clinic; of these, there were 118 with a cancer of the cervix diagnosis, and 85 in a pre-cancerous condition (prolonged, non-healing erosions, senile colpitis, ectropion, and so forth).

A histological examination was made on biopsy material in all cases of cancer of the cervix before surgery.

The cytological picture of the smears in clinically obvious forms of cancer of the cervix was characterized by the full complex of typical changes in the cellular elements. The light emitted by the cytoplasm was dull green, while that from the net-like or small lumps (ribonucleic acid) was reddish-orange. As distinct from normal epithelial cells, whose nuclei shine with an amerald green light, the nuclei of a typical epithelium shine with a whitish-yellow or whitish-green light.

In cervical cancer of the carcinoma in situ type, the luminescent method did not show the full complement of changes. In four out of 118 cases of cancer of the cervix, the luminescent microscope did not show those changes, characteristic of cancer.

In 85 cases of precancerous conditions, the luminescent method showed those peculiarities typically present in the normal cellular elements.

Conclusions

1) The luminescent method of studying the cytological picture of materia taken from the surface of the uterine cervix, the vaginal content, a sector of the cervical canal, and from the uterine cavity is effective and can be successfully used in hospital and polyclinic practice.

2) Neither the positive nor the negative results of luminescent analysis can be considered as decisive in a conclusive diagnosis of cancer. The latter must be confirmed by biopsy with histological examination. In those forms of cancer of the cervix which show no clinically expressed symptoms, it is necessary to use all other available methods of examination: phase contrasting microscopy, the cytology of vaginal smears, the Roskin reaction, etc.

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